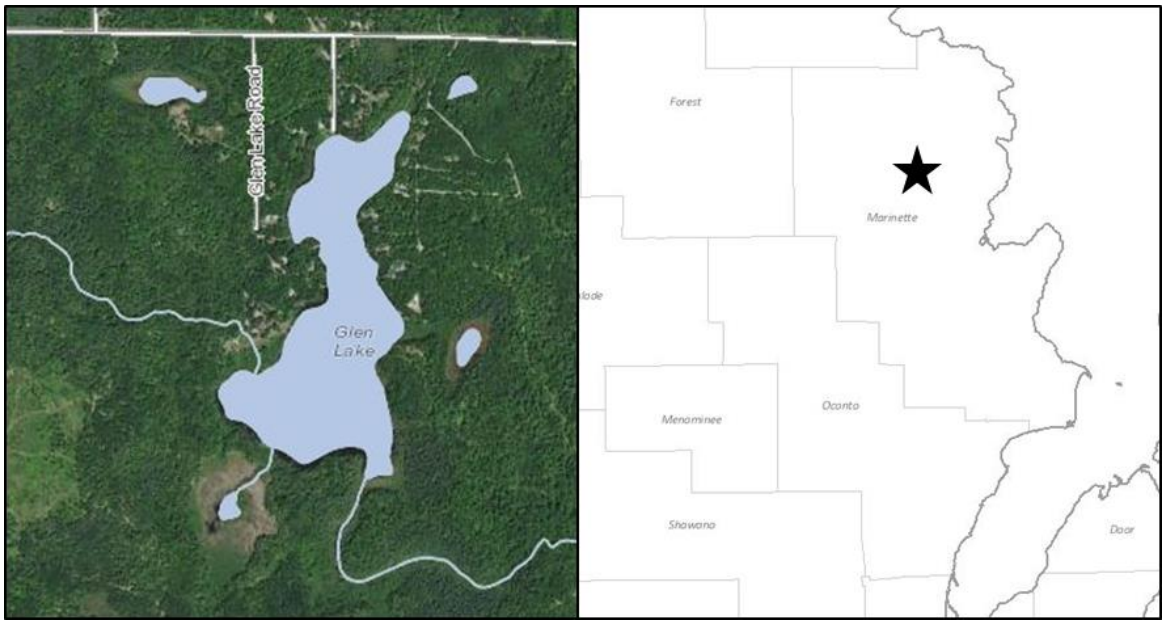
GLEN LAKE

Marinette County

2016 Fish Management Report

Michael F. Vaske
Fisheries LTE

Christopher C. Long
Fisheries Biologist



Wisconsin Department of Natural Resources
101 Ogden Road
Suite A
Peshtigo, Wisconsin 54157

WISCONSIN DEPT. OF NATURAL RESOURCES

SPORT FISH RESTORATION

2017

SUMMARY

Lake and Location:
Glen Lake, Marinette County, T35N R19E Section 14

Physical / Chemical attributes (Carlson et al. 1975):
Surface acres: 49
Maximum depth (ft): 24
Lake type: Drainage lake
Basic water chemistry: Neutral, light brown water with high transparency.
Littoral substrate: 30% sand, 70% muck
Aquatic vegetation: Moderate density of floating and submergent vegetation in the littoral zone.
Other features: Glen Lake has two inlets; one from John Lake and one from an unnamed spring pond. The outlet flows to the South Branch Pike River. The town of Athelstane provides public access with parking. The shoreline is 80% upland consisting of upland hardwoods, and the remainder is shrub meadow.

Purpose of Survey:
Determine current status of fishery.

Surveys:
WDNR Survey ID: 515081422 - Fisheries assessment; Late spring bass and panfish; May 25, 2016.

Fishery:
Largemouth bass and bluegill are abundant. Pumpkinseed and yellow perch are common, while black crappie, northern pike, and white sucker are present.

EXECUTIVE SUMMARY

- Glen Lake is a 49-acre drainage lake located in northern Marinette County near the Town of Amberg. The Town of Athelstane provides public access with parking.

- Glen Lake is neutral, light brown water with high transparency. The littoral substrate is composed of 30% sand, and 70% muck. The shoreline is approximately 1.8 miles and is primarily upland (80%) consisting of upland hardwoods, and the remainder is shrub meadow.

- Stocking records from 1938 to 1953 provide accounts of several species being stocked. Species stocked included, walleye, yellow perch, and largemouth bass.

- Overall, 276 fish representing 5 species were collected during the 2016 survey. (Table 4). The three most abundant species collected were bluegill (64%), pumpkinseed (13%) and largemouth bass (13%). Additional species collected consisted of yellow perch (7%), and white sucker (3%).

- A total of 178 bluegill was collected and accounted for 64% of all fish collected. Bluegill collected ranged in size from 3.4 to 8.5 inches. Growth appears to be average compared to other lakes in northern Wisconsin. Bluegill appear to have good reproduction and recruitment.

- A total of 36 largemouth bass was collected and accounted for 13% of the total fish collected. Largemouth bass collected ranged in size from 5.4 to 17.0 inches. Growth of largemouth bass was average until age 4, with older ages below average compared to other lakes in northern Wisconsin.

- A total of 37 pumpkinseed was collected and accounted for 13% of the total fish collected. Pumpkinseed collected ranged in size from 3.4 – 7.6 inches.

- Additional species collected during the 2016 survey included yellow perch and white sucker. Low numbers of these two species were collected and accounted for approximately 10% of all fish collected.

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INTRODUCTION

Glen Lake is a 49-acre drainage lake located in northern Marinette County near the Town of Amberg (Figure 1). Glen Lake is neutral, light brown water with high transparency. The littoral substrate is composed of 30% sand, and 70% muck. The shoreline is approximately 1.8 miles and is primarily upland (80%) consisting of upland hardwoods, and the remainder is shrub meadow. The Town of Athelstane provides public access with parking.

Historical stocking records from 1938-1953 provide accounts of several fish species being stocked by the Star Lake association (Table 1). Species stocked consisted of walleye, yellow perch, and largemouth bass. Largemouth bass was the most frequent species stocked with several stocking events occurring between 1942 and 1953.

The last fisheries survey by the Wisconsin Department of Natural Resources (WDNR) on Glen Lake was in 2003. The goal of the survey was to determine the status of the fishery and estimate relative abundance of fish species present. A one-night electrofishing survey in mid-September of the entire shoreline was utilized to evaluate the fishery.

The most recent survey was conducted in May 2016 and consisted of a one-night electrofishing survey. The goal of the 2016 survey was to assess the fishery based on relative abundance, proportional stock density (PSD), relative stock density (RSD), catch per unit effort (CPUE), and mean length at capture/age. Due to the differences in survey timing and changes in WDNR fish sampling protocols, it will be difficult to detect changes in the fishery, but comparisons will be made when and where appropriate.

METHODS

Data collection:

A standard WDNR direct current electrofishing boat was used to collect fish on Glen Lake. All fish collected were measure to the nearest 0.1 inch total length (TL) and separated into 0.5 inch length bins. A sub-sample of scales or dorsal spines was collected for age and growth analysis from all gamefish. Aging structures (scales or spines) were collected from five non young-of-year (YOY) fish per half inch bin. If sex could be determined, structures from five fish per sex were collected per half inch bin. Aging structures for panfish and nongame fish consisted of 5 samples per half inch group when sex could not be determined. Ages were assigned to each fish using standard WDNR procedures.

Data analysis:

Relative abundance was calculated as the percentage each species represented from the total sample. Proportional stock density (PSD) and relative stock density for preferred length fish (RSD^P) were calculated for dominant gamefish (Anderson and Neumann 1996). Preferred lengths of various gamefish have a minimum length between 45 and 55% of the world record length for that species (Table 2; Anderson and Neumann). Stock, quality, and preferred lengths

used were proposed by Gabelhouse (1984), Anderson and Neumann (1996), and Bister et al. (2000) (Table 2). Catch per unit effort was calculated as catch divided by sampling effort (minutes or miles) for each species collected. Mean length at capture/age was calculated for all dominant gamefish and compared to the average of mean length at age for Northern Wisconsin during June and July.

RESULTS

Overall, 276 fish representing 5 species were collected during the 2016 survey. (Table 4). The three most abundant species collected were bluegill (64%), pumpkinseed (13%) and largemouth bass (13%). Additional species collected consisted of yellow perch (7%), and white sucker (3%).

A total of 178 bluegill was collected and accounted for 64% of the total fish collected (Table 4.) Catch per unit effort from 2016 electrofishing survey was 118.7 / mile (Table 5). Bluegill collected reanged in size from 3.4 to 8.5 inches (Figure 2). Bluegill PSD was 55 and RSD^P was 1. Bluegill PSD was within the desirable range for a balanced population, but RSD^P was below the desirable range (Table 2). Fifty-five percent of bluegill sampled were ≥ 6 inches, which is often considered to be the minimum size anglers will harvest. A subsample of 33 bluegill was aged from 4 to 8years old. Growth appears to be average compared to other lakes in northern Wisconsin (Figure 3). Bluegill reproduction and recruitment look good.

A total of 36 largemouth bass was collected and accounted for 13% of the total fish collected (Table 4). Catch per unit effort from 2016 electrofishing survey was 24.0 / mile (Table 5). Largemouth bass collected ranged in size from 5.4 to 17.0 inches (Figure 4). Largemouth bass PSD was 35 and RSD^P was 3. Neither PSD or RSD^P were within the desirable range for a balanced population (Table 2). Eight percent of largemouth bass sampled were over the 14 inch minimum length limit. A subsample of 35 largemouth bass was aged from 2 to 13 years old. Growth of largemouth bass was average until age 4, with older ages below average compared to other lakes in northern Wisconsin (Figure 5).

A total of 37 pumpkinseed was collected and accounted for 13% of the total fish collected (Table 4). Catch per unit effort was 49 per hour (Table 5). Pumpkinseed collected ranged in size from 3.4 – 7.6 inches (Figure 6). Thirty-seven percent of pumpkinseed sampled were ≥ 6 inches, which is often considered to be the minimum size anglers will harvest.

Additional species collected during the 2016 survey included yellow perch and white sucker. Low numbers of these two species were sampled and accounted for approximately 10% of all fish collected (Table 4).

DISCUSSION

Since the previous survey in 2003, fish sampling protocols have changed. Changes occurred in the timing of sampling periods with regards to the species being targeted. The most recent survey on Glen Lake in 2016 was conducted in mid-May to specifically target bass and panfish, while the survey in 2003 was conducted mid-September. The differences in timing between the two surveys will make difficult to compare and determine differences in fish populations.

Bluegill and pumpkinseed abundance appear to have increased since the previous survey. However, the increased catch rates could be due to the timing of the surveys. The most recent survey was conducted in May, when bluegill and pumpkinseed are close to shore on spawning beds, making them more susceptible to the sampling gear. The length frequencies of bluegill and pumpkinseed suggest reproduction and recruitment are stable and indicate anglers should have the opportunity to harvest panfish.

Largemouth bass abundance and size structure was similar between the 2003 and 2016 surveys. Reproduction and recruitment of largemouth bass is good. Growth was below average compared to the northern Wisconsin average but a few, larger bass are available for anglers to target/harvest.

The fishery on Glen Lake appears to be stable and should provide anglers with an opportunity to catch and harvest fish. The current, statewide fishing regulations are adequate and will continue to provide a respectable fishing opportunity therefore, no fishing regulation changes are recommended.

LITERATURE CITED

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Carlson, H. L., L. M. Andrews, and C. W. Threinen. 1975. Surface water resources of Marinette County. Wisconsin Department of Natural Resources, Madison, WI.

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APPENDIX I – TABLES

Table 1. Stocking history since 1938 for Glen Lake, Marinette County, Wisconsin.

Stocking Date	Species	Number Stocked	Size
1938	Walleye	598,845	Fry
1941	Yellow perch	635	Adult
1941	Yellow perch	300	Fingerling
1942	Largemouth bass	480	Fingerling
1944	Largemouth bass	200	Fingerling
1949	Largemouth bass	1000	Fingerling
1950	Largemouth bass	2500	Fingerling
1952	Largemouth bass	420	Fingerling
1953	Largemouth bass	400	Fingerling

Table 2. Accepted stock density index ranges for balanced fish populations and length categories proposed for various fish species. Measurements are minimum total lengths for each category in inches. Updated from Anderson and Neumann (1996) and Bister et al. (2000).

Species	PSD	RSD-P	Stock	Quality	Preferred	Memorable	Trophy
Black crappie		> 10	5	8	10	12	15
Bluegill	20 - 60	5 - 20	3	6	8	10	12
Brown bullhead			5	8	11	14	17
Largemouth bass	40 - 70	10 - 40	8	12	15	20	25
Muskellunge			20	30	38	42	50
Northern pike	30 - 60		14	21	28	34	44
Pumpkinseed			3	6	8	10	12
Rock bass			4	7	9	11	13
Walleye	30 - 60		10	15	20	25	30
Yellow perch	30 - 60		5	8	10	12	15
Yellow bullhead			4	8	9	11	14

Table 3. Fishing regulations for Glen Lake, Marinette County, Wisconsin for the 2017-2018 season.

Species	Fishing Season	Daily Limit	Minimum Length
Largemouth bass	May 7- March 5	5	14 inches
Smallmouth bass	May 7- June 17	Catch and release	
	June 18- March 5	5 in total with LMB	14 inches
Northern pike	May 7- March 5	5	None
Panfish (bluegill, pumpkinseed, crappie, and yellow perch)	Open all year	25 in total	None
Bullheads	Open all year	None	None
Rock bass	Open all year	None	None

Table 4. Relative abundance and length range (inches) of fishes sampled during 2016 survey of Glen Lake, Marinette County, Wisconsin.

	May 2016			September 2003		
Common Name of Fish	Number	Percent	Length Range (Inches)	Number	Percent	Length Range (Inches)
Bluegill	178	64	3.4 - 8.5	79	50	2.4 - 7.5
Largemouth Bass	36	13	5.4 - 17.0	40	25	4.1 - 18.9
Pumpkinseed	37	13	3.4 - 7.4	6	4	3.2 - 6.5
White Sucker	7	3	7.8 - 18.9			
Yellow Perch	18	7	3.2 - 7.6	18	11	4.1 - 6.6
Black crappie				8	5	5.4 - 7.5
Northern pike				7	4	17.3 - 27.1
Total	276			158		

Table 5. Electrofishing catch per unit effort (CPUE) for Glen Lake surveys from 2003 and 2016.

	Electrofishing CPUE					
	May 2016			September 2003		
Species	Total Catch	CPUE / mile	CPUE / hour	Total Catch	CPUE / mile	CPUE / hour
Black crappie				8	4.4	8.9
Bluegill	178	118.7	237.3	79	43.9	87.8
Largemouth bass	36	24.0	48.0	40	22.2	44.4
Northern pike				7	3.9	7.8
Pumpkinseed	37	24.7	49.3	6	3.3	6.7
Yellow Perch	18	12.0	24.0	18	10.0	20.0

APPENDIX II – FIGURES

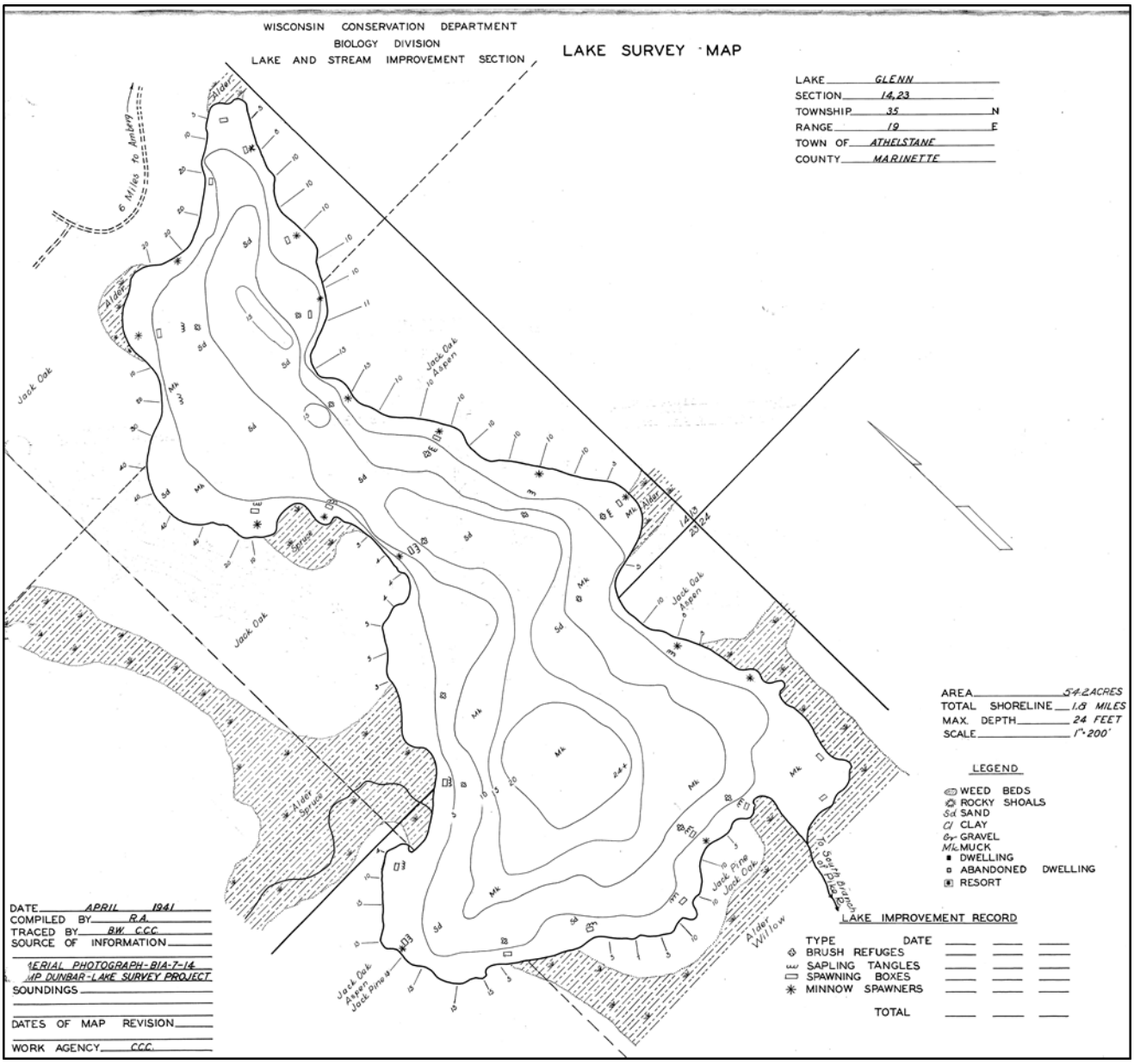


Figure 1. Contour map of Glen Lake, Marinette County, Wisconsin.

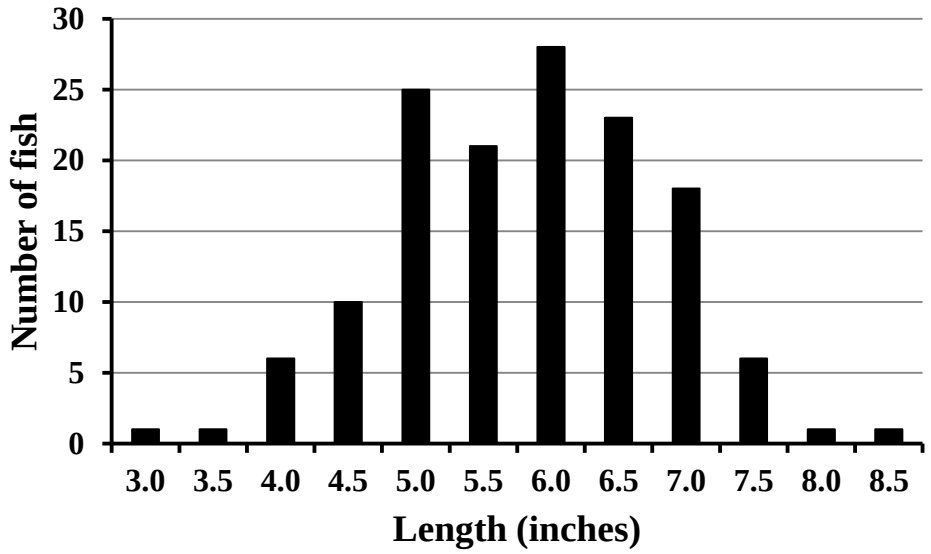


Figure 2. Length frequency of bluegill sampled during the 2016 survey on Glen Lake, Marinette County, Wisconsin.

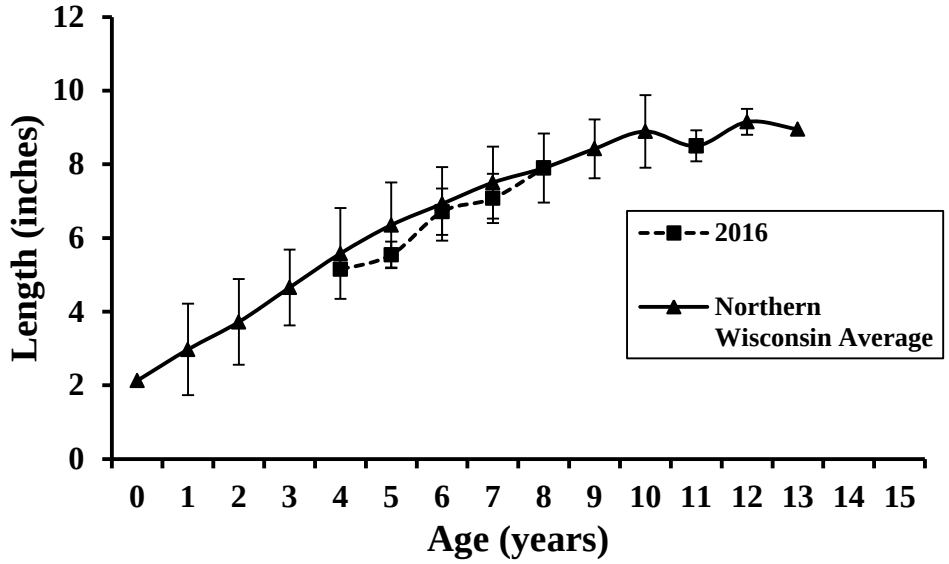


Figure 3. Mean length at age of bluegill sampled during the 2016 survey of Glen Lake, Marinette County, Wisconsin.

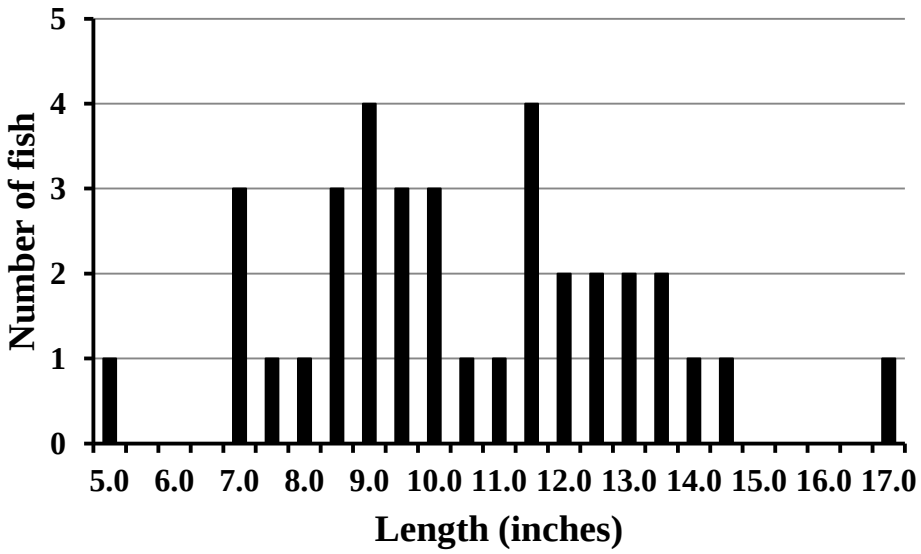
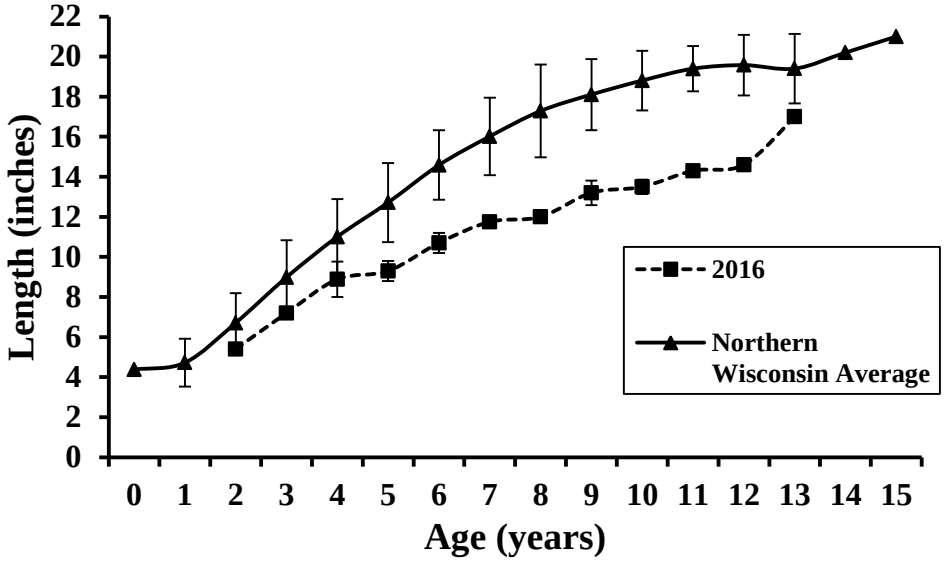


Figure 4. Length frequency of largemouth bass sampled during the 2016 survey on Glen Lake, Marinette County, Wisconsin.



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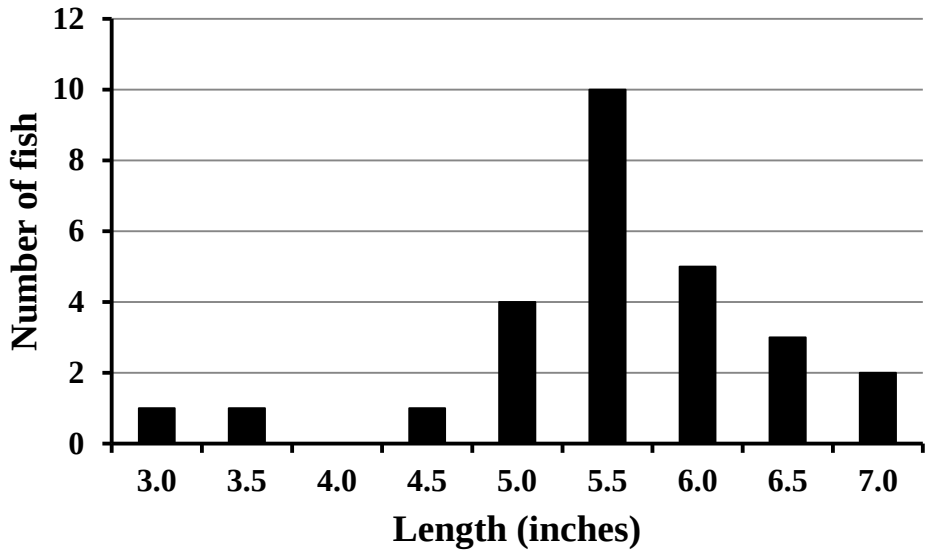

Figure 6. Mean length at age of pumpkinseed sampled during the 2016 survey on Glen Lake, Marinette County, Wisconsin.